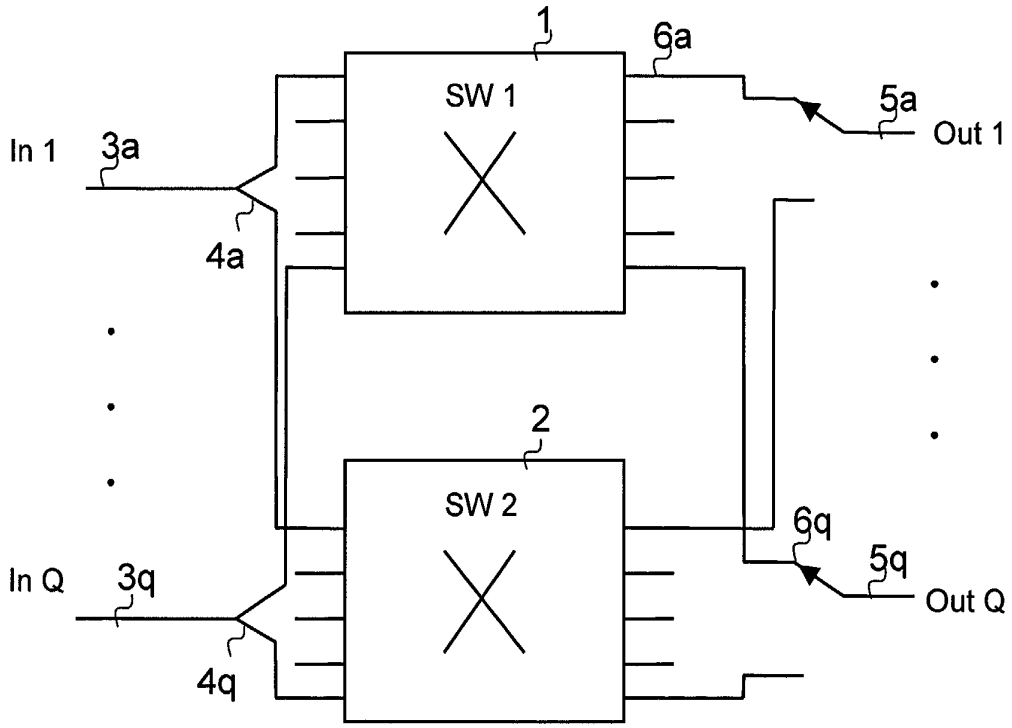

Fig. 1
Prior Art

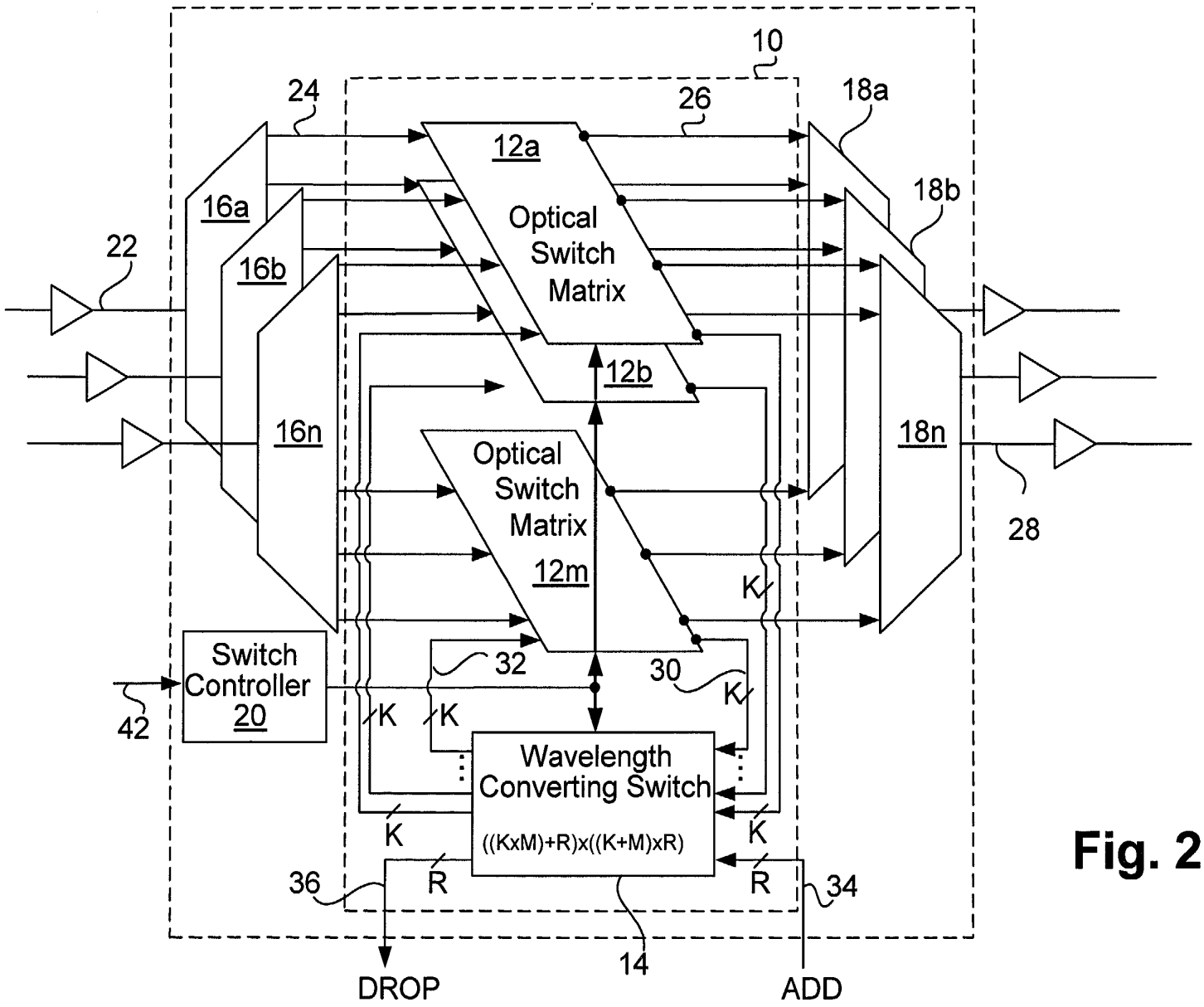
10
24
26
18a
12a
Optical
Switch
Matrix
16a
18b
22
16b
12b
16n
18n
Optical
Switch
Matrix
12m
28
K
Switch
Controller
20
32
30
42
K
K
K
Wavelength
Converting Switch
((KxM)+R)x((K+M)xR)
K
36
R
R
34
14
DROP
ADD

Fig. 2

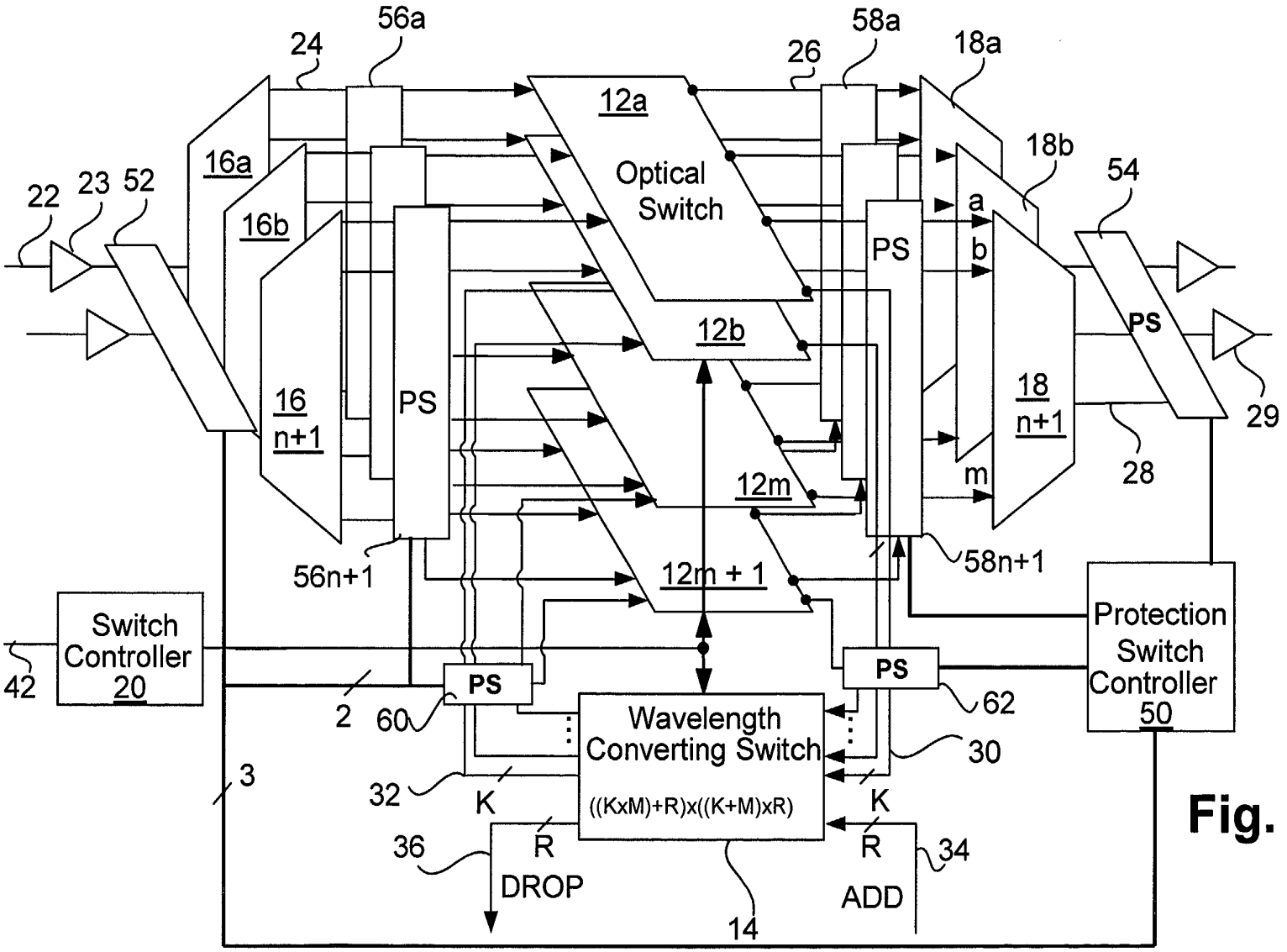
24
56a
26
58a
18a
12a
Optical
Switch
16a
16b
22
23
52
18b
54
a
b
PS
PS
16
n+1
PS
12b
18
n+1
29
28
12m
m
56n+1
58n+1
12m + 1
Switch
Controller
20
42
Protection
Switch
Controller
50
PS
PS
2
60
62
Wavelength
Converting Switch
((KxM)+R)x((K+M)xR)
30
3
32
K
K
36
R
R
34
DROP
ADD
14

Fig. 3

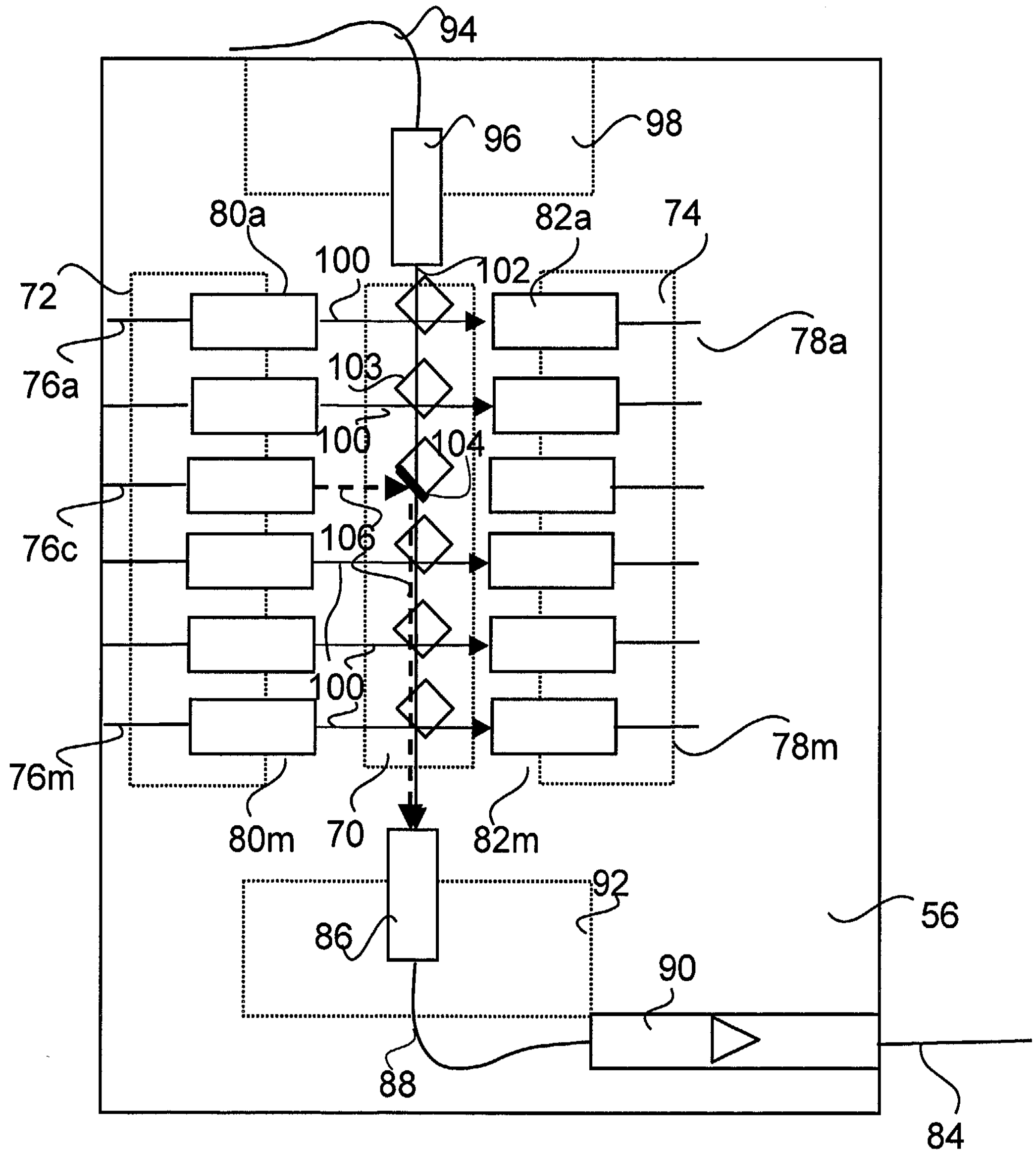
94
96
98
80a
82a
74
72
100
102
76a
78a
103
100
104
76c
106
100
76m
78m
80m
70
82m
92
86
56
90
88
84

Fig. 4

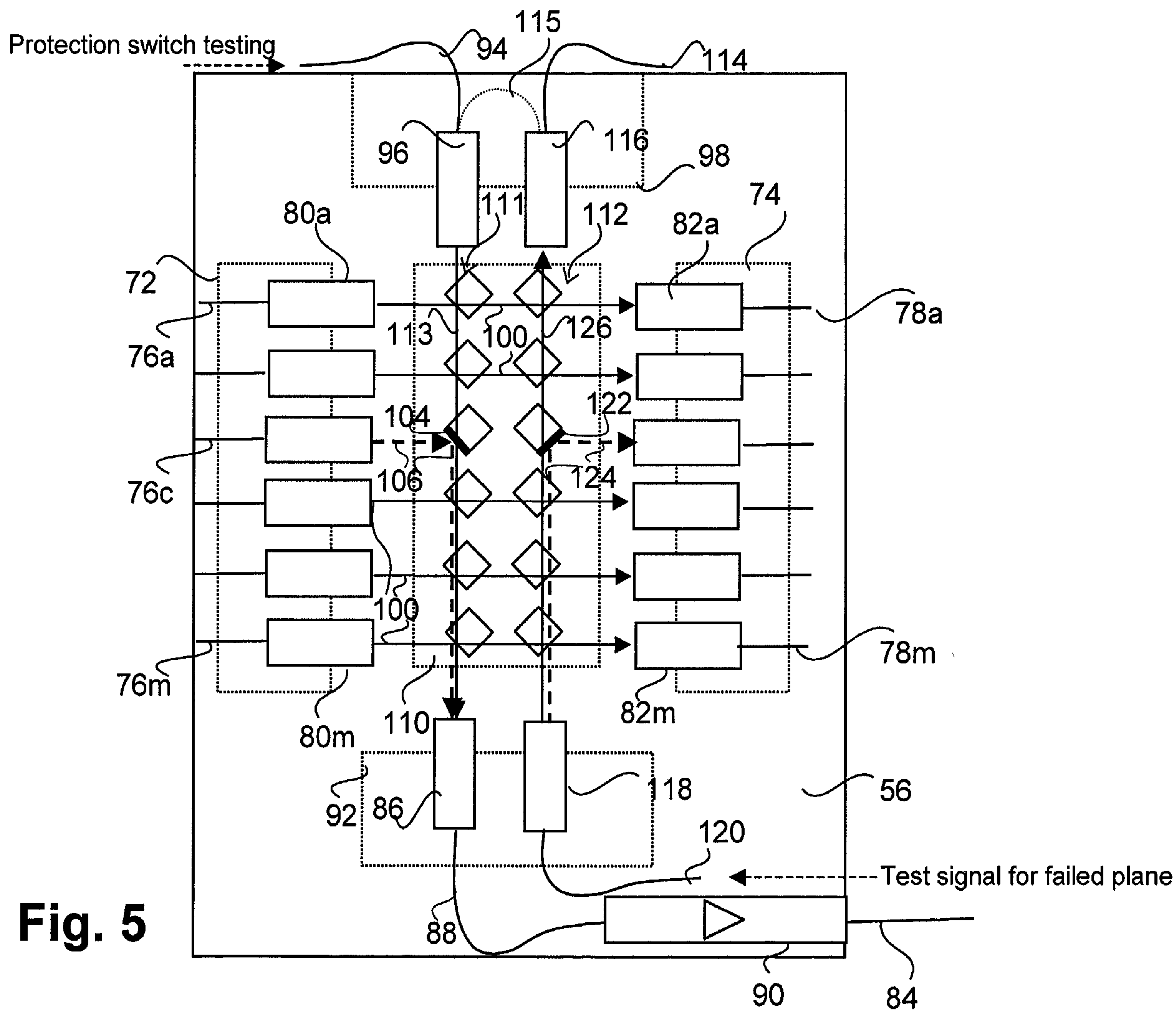
Protection switch testing
Test signal for failed plane
94
115
114
96
116
98
111
112
74
80a
82a
72
78a
113
100
126
76a
104
122
106
124
76c
100
76m
78m
80m
110
82m
118
56
92
86
120
88
90
84

Fig. 5

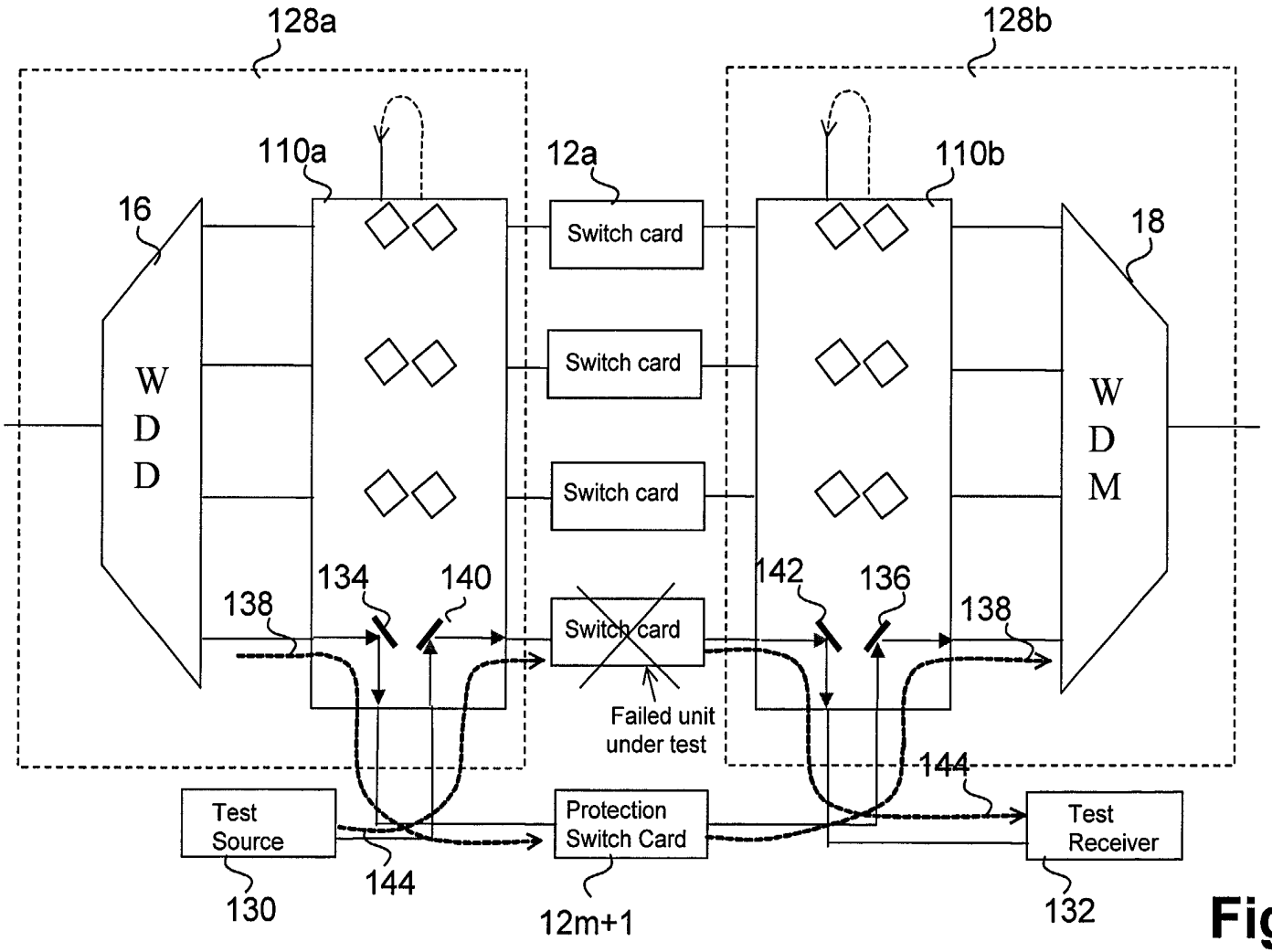
128a
128b
110a
12a
110b
16
18
Switch card
Switch card
Switch card
Switch card
W
D
D
W
D
M
134
140
142
136
138
138
Failed unit
under test
144
Test
Source
Protection
Switch Card
Test
Receiver
144
130
12m+1
132

Fig. 6

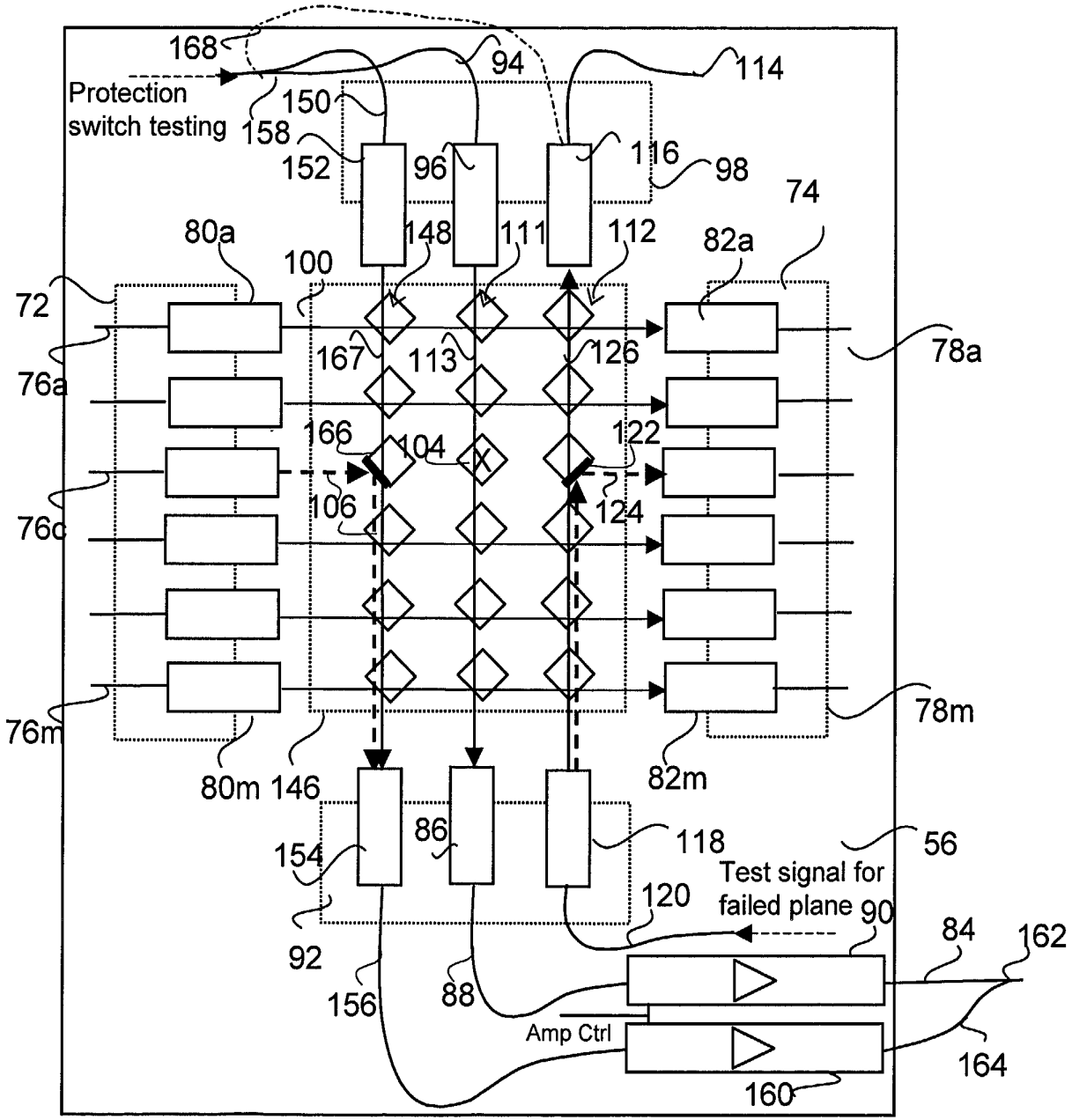
168
Protection switch testing
94
114
150
158
152
96
116
98
74
80a
148
111
112
82a
100
72
167
113
126
78a
76a
166
104
122
106
124
76c
76m
80m
146
82m
78m
86
118
56
154
Test signal for failed plane
120
90
84
162
92
156
88
Amp Ctrl
164
160

Fig. 7

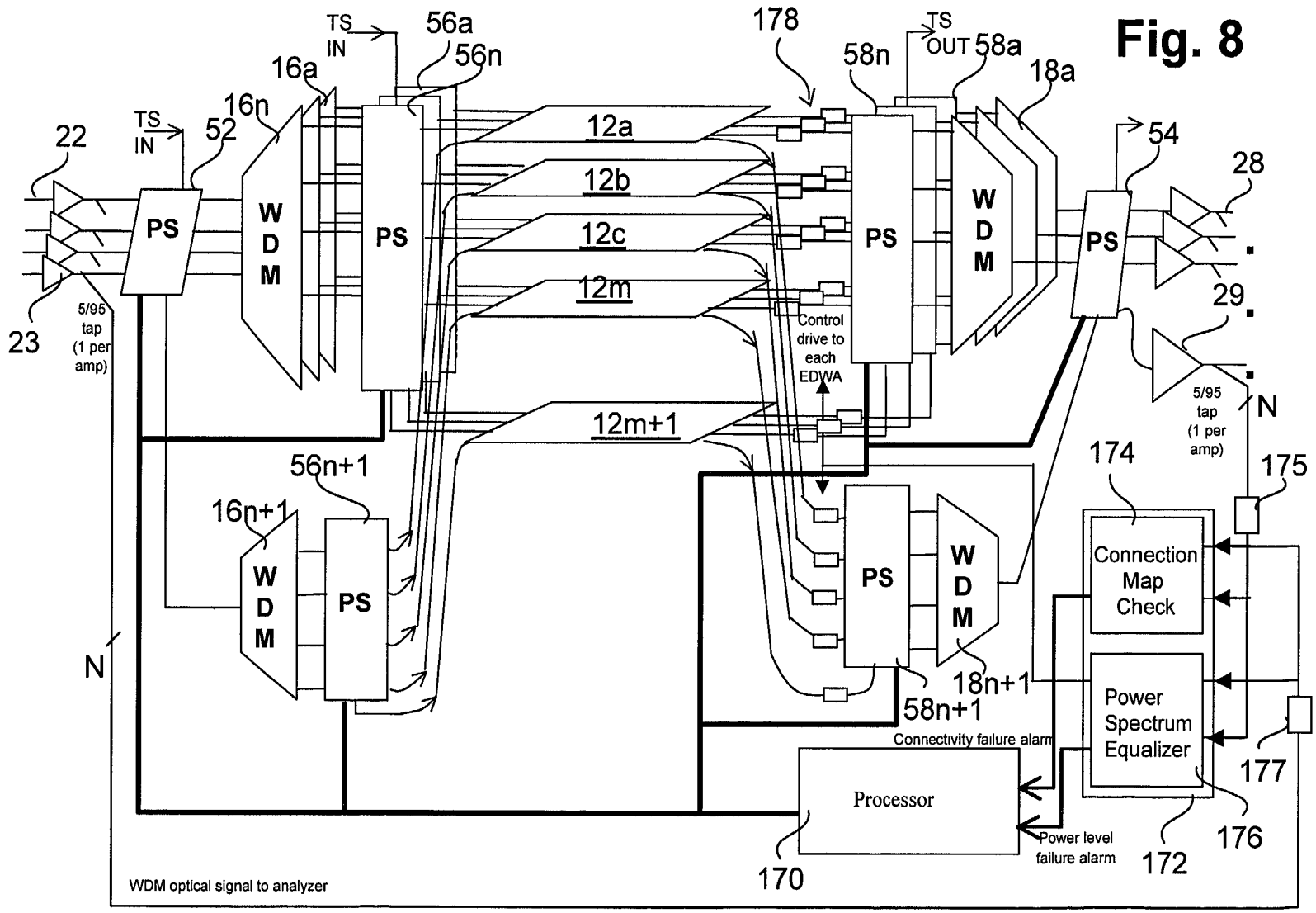
TS IN
56a
56n
178
58n
TS OUT
58a
18a
16a
16n
22
TS IN
52
12a
12b
12c
12m
54
28
PS
WDM
PS
PS
WDM
PS
23
5/95 tap (1 per amp)
Control drive to each EDWA
29
N
5/95 tap (1 per amp)
12m+1
56n+1
16n+1
174
175
Connection Map Check
PS
WDM
PS
N
18n+1
58n+1
Power Spectrum Equalizer
Connectivity failure alarm
177
Processor
176
Power level failure alarm
172
170
WDM optical signal to analyzer

Fig. 8

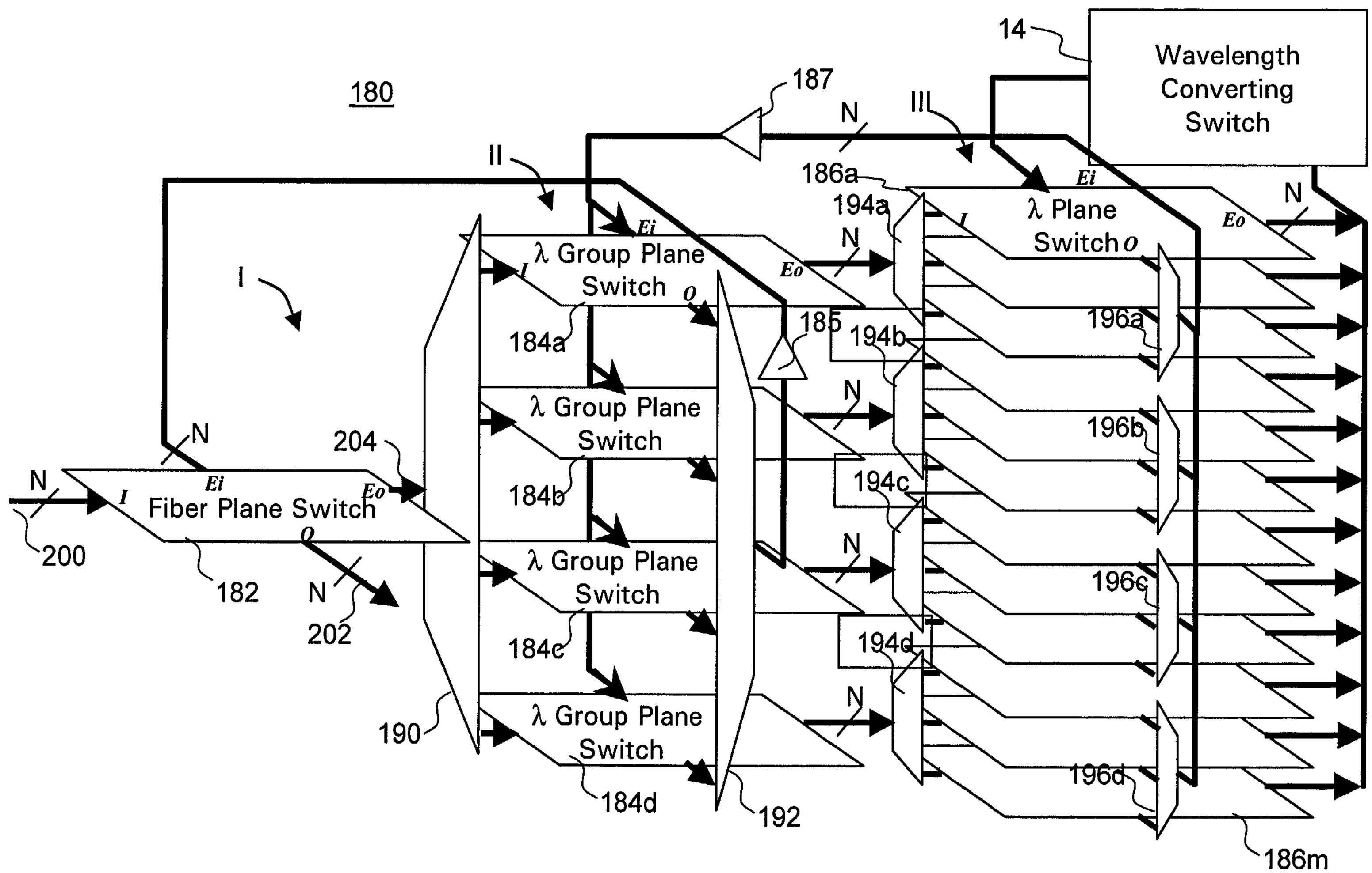
180
I
II
III
N
200
I
Ei
Fiber Plane Switch
Eo
O
182
202
204
190
λ Group Plane Switch
184a
184b
184c
184d
192
185
187
186a
194a
194b
194c
194d
λ Plane Switch
196a
196b
196c
196d
186m
14
Wavelength Converting Switch

Fig. 9

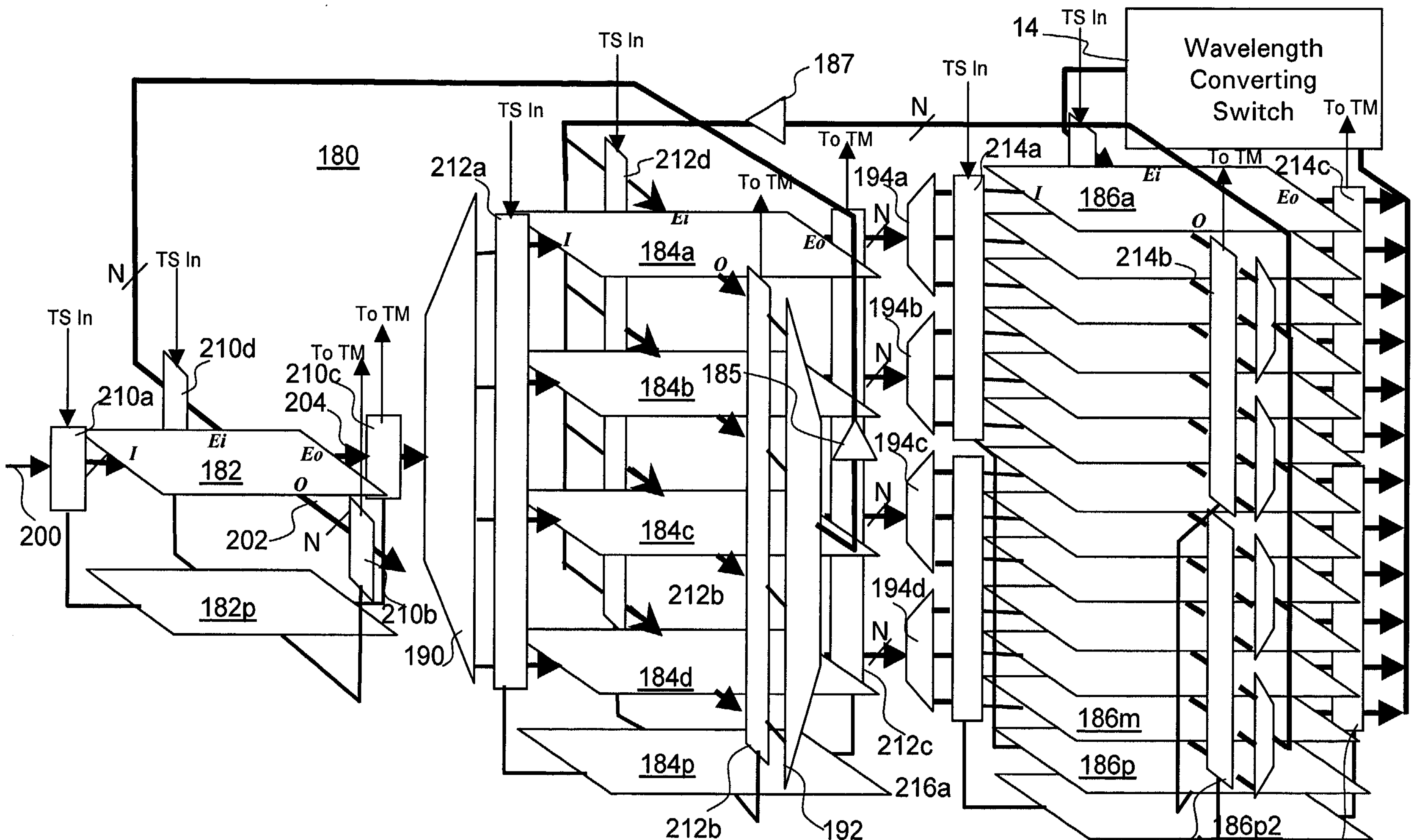
180
Wavelength Converting Switch
14
TS In
To TM
N
187
210a
210b
210c
210d
200
202
204
182
182p
I
Ei
Eo
O
190
212a
212b
212c
212d
184a
184b
184c
184d
184p
185
192
194a
194b
194c
194d
214a
214b
214c
186a
186m
186p
186p2
216a
216b
216c

Fig. 10

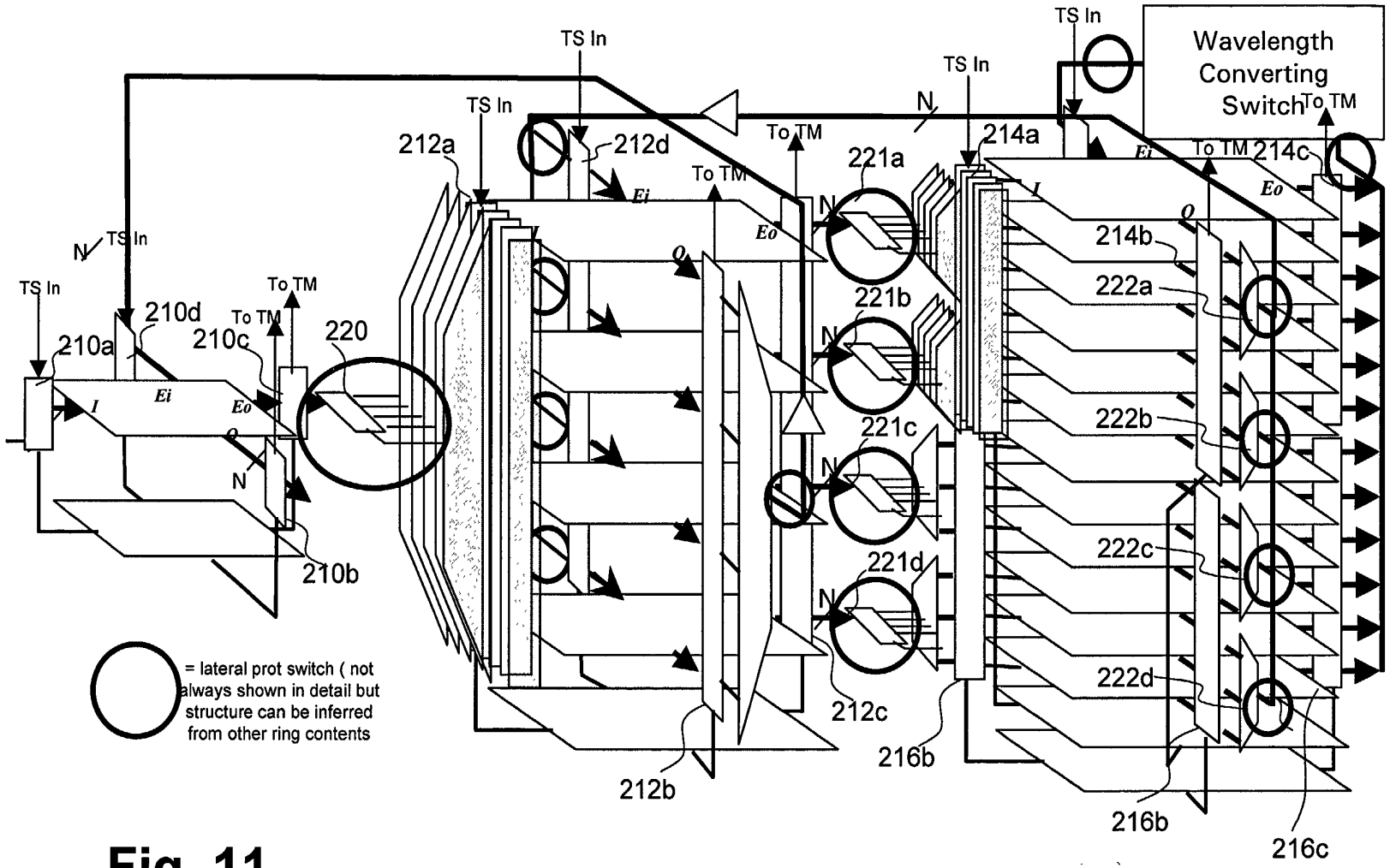
TS In
Wavelength Converting Switch
To TM
212a
212d
214a
214c
221a
221b
221c
221d
214b
222a
222b
222c
222d
210a
210b
210c
210d
220
212b
212c
216b
216c
Ei
Eo
I
O
N
= lateral prot switch (not always shown in detail but structure can be inferred from other ring contents

Fig. 11

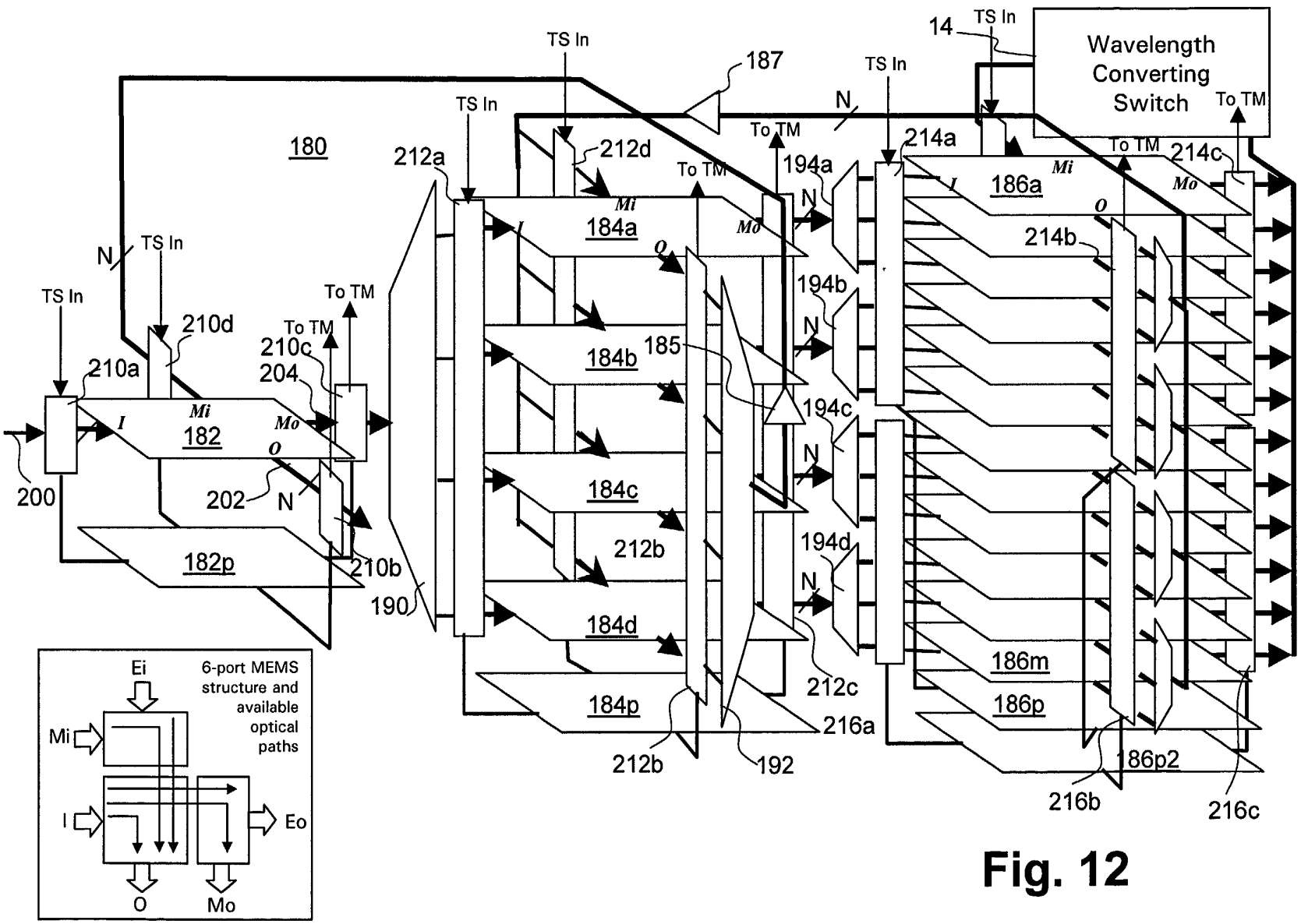
Wavelength Converting Switch
14
TS In
187
180
212a
212d
184a
184b
184c
184d
184p
182
182p
210a
210b
210c
210d
204
200
202
190
185
212b
212c
192
216a
194a
194b
194c
194d
186a
186m
186p
186p2
214a
214b
214c
216b
216c
To TM
N
Mi
Mo
I
O
6-port MEMS structure and available optical paths
Ei
Eo

Fig. 12

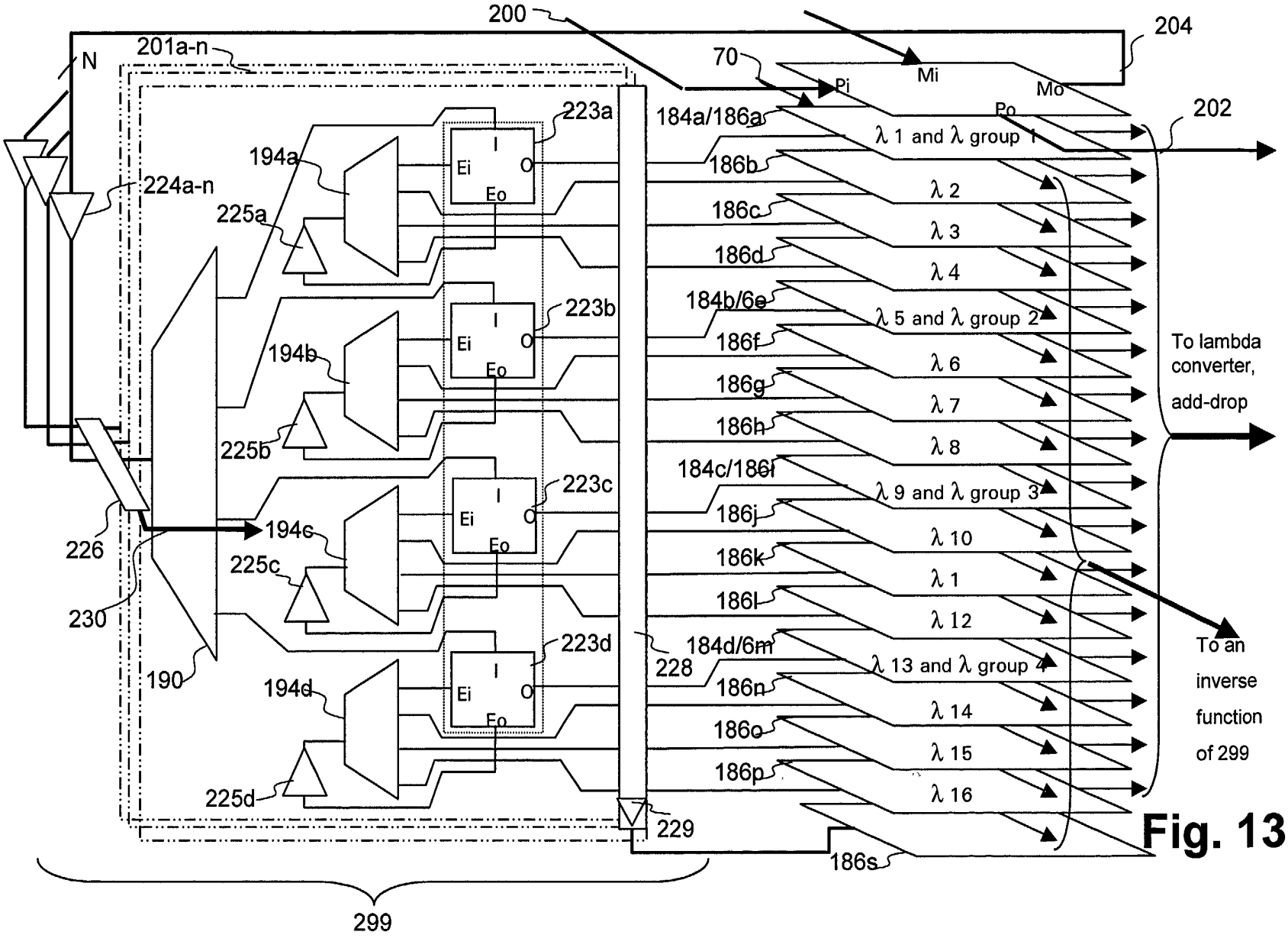
200
201a-n
N
I
70
Pi
Mi
Mo
Po
204
202
223a
194a
224a-n
225a
Ei
Eo
O
184a/186a
186b
λ 1 and λ group 1
186c
λ 2
186d
λ 3
λ 4
184b/6e
186f
λ 5 and λ group 2
186g
λ 6
186h
λ 7
λ 8
184c/186i
186j
λ 9 and λ group 3
186k
λ 10
186l
λ 1
λ 12
184d/6m
186n
λ 13 and λ group 4
186o
λ 14
186p
λ 15
λ 16
186s
223b
194b
225b
223c
194c
225c
226
230
190
223d
194d
225d
228
229
299
To lambda converter, add-drop
To an inverse function of 299

Fig. 13

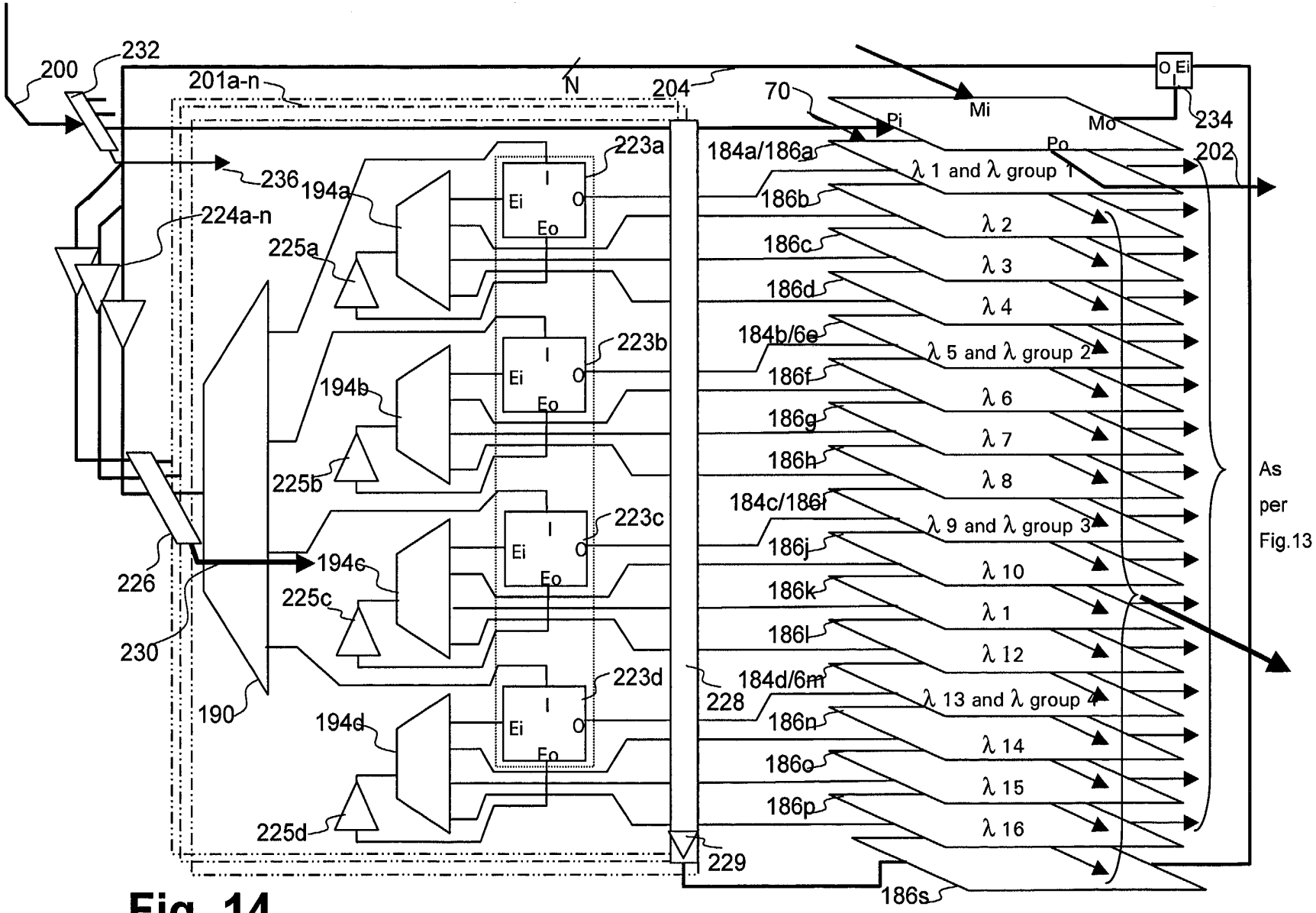
200
232
201a-n
N
204
70
Pi
Mi
Mo
Po
O Ei
234
202
236
224a-n
194a
225a
223a
Ei
I
O
Eo
184a/186a
λ 1 and λ group 1
186b
λ 2
186c
λ 3
186d
λ 4
184b/6e
λ 5 and λ group 2
186f
λ 6
186g
λ 7
186h
λ 8
184c/186i
λ 9 and λ group 3
186j
λ 10
186k
λ 1
186l
λ 12
184d/6m
λ 13 and λ group 4
186n
λ 14
186o
λ 15
186p
λ 16
186s
194b
225b
223b
194c
225c
223c
194d
225d
223d
226
230
190
228
229
As per Fig.13

Fig. 14